

AUG 8 2006

Serial No. 10/737,408
60246-555;10193AMENDMENTIN THE CLAIMS:

1. (CURRENTLY AMENDED) A conjugate pair of intermeshing rotors ~~having helical lobes~~ comprising:

a female rotor and a male rotor each including helical lobes having helical crests and intervening grooves, wherein the female rotor and the male rotor each rotate and adapted for rotation about a parallel axes-axis within a working space of a screw rotor machine, and each of the female rotor and the male rotor includes, each rotor has a tip circle, a pitch circle, and a root circle,

wherein a one rotor of each pair being a female rotor such that the major portion of each lobe of the helical lobes of said the female rotor is located inside said the pitch circle of said the female rotor, and a the other rotor being a male rotor formed such that the major portion of each of the helical lobes lobe of said the male rotor is located outside said the pitch circle of said the male rotor,

wherein the helical lobes of one of the male rotor and the female rotor followsfollowing the intervening grooves of the other of the male rotor and the female rotor to form a continuous sealing line between said pair of rotors the male rotor and the female rotor,

wherein each of said the helical lobes having have a primary leading flank portion and a secondary trailing flank portion,

wherein said primarythe leading flank portion of said the helical lobes of said the female rotor have a profile formed from at least one ellipse and said primarythe leading flank portion of said the helical lobes of said the male rotor have a profile formed from at least one ellipsesellipse, and

wherein the trailing flank portion of the helical lobes of at least one of the female rotor and the male rotor has a profile formed from at least one ellipse.

2. (CURRENTLY AMENDED) The conjugate pair of intermeshing rotors according to claim 1, wherein ~~said primarythe leading flank portion of said the helical lobes of said the female rotor is formed by a first tangent ellipse and a second tangent ellipses ellipse and said primarythe leading flank portion of said the helical lobes of said the male rotor is formed by a first tangent ellipse and a second tangent ellipsesellipses.~~

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3. (NEW) The conjugate pair of intermeshing rotors according to claim 1, wherein the trailing flank portion of the helical lobes of both the female rotor and the male rotor have a profile formed from said at least one ellipse.
4. (NEW) The conjugate pair of intermeshing rotors according to claim 3, wherein the trailing flank portion of the helical lobes of the female rotor is formed by a first tangent ellipse and a second tangent ellipse and the trailing flank portion of the helical lobes of the male rotor is formed by a first tangent ellipse and a second tangent ellipse.
5. (NEW) The conjugate pair of intermeshing rotors according to claim 1, further including a female root portion between the leading flank portion and the trailing flank portion of the female rotor and a male tip portion between the leading flank portion and the trailing flank portion of the male rotor, wherein both the female root portion and the male tip portion are circular arcs.
6. (NEW) The conjugate pair of intermeshing rotors according to claim 1, further including a female tip portion between the leading flank portion and the trailing flank portion of the female rotor and a male root portion between the leading flank portion and the trailing flank portion of the male rotor, wherein both the female tip portion and the male root portion are circular arcs.
7. (NEW) The conjugate pair of intermeshing rotors according to claim 6, wherein the circular arcs are formed of a first circular arc and a second circular arc.

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8. (NEW) The conjugate pair of intermeshing rotors according to claim 1,
wherein the trailing flank portion of the helical lobes of both the female rotor and the male rotor have a profile formed from said at least one ellipse,
wherein the leading flank portion of the helical lobes of the female rotor is formed by a first tangent ellipse and a second tangent ellipse and the leading flank portion of the helical lobes of the male rotor is formed by a first tangent ellipse and a second tangent ellipse,
wherein the trailing flank portion of the helical lobes of the female rotor is formed by a first tangent ellipse and a second tangent ellipse and the trailing flank portion of the helical lobes of the male rotor is formed by a first tangent ellipse and a second tangent ellipse, and
wherein a circular arc is defined between the leading flank portion and the trailing flank portion to define one of a tip portion and a root portion.
9. (NEW) The conjugate pair of intermeshing rotors according to claim 1, wherein the conjugate pair of intermeshing rotors are employed with one of a compressor and an expander.

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10. (NEW) A conjugate pair of intermeshing rotors comprising:

a female rotor and a male rotor each including helical lobes having helical crests and intervening grooves, wherein the female rotor and the male rotor each rotate about a parallel axis within a working space of a screw rotor machine, and wherein each of the female rotor and the male rotor include a tip circle, a pitch circle, and a root circle,

wherein a major portion of each of the helical lobes of the female rotor is located inside the pitch circle of the female rotor, and a major portion of each of the helical lobes of the male rotor is located outside the pitch circle of the male rotor,

wherein the helical lobes of one of the male rotor and the female rotor follows the intervening grooves of the other of the male rotor and the female rotor to form a continuous sealing line between the male rotor and the female rotor,

wherein each of the helical lobes have a leading flank portion and a trailing flank portion,

wherein the leading flank portion of the helical lobes of the female rotor have a profile formed from at least one ellipse and the leading flank portion of the helical lobes of the male rotor have a profile formed from at least one ellipse,

wherein the trailing flank portion of the helical lobes of the female rotor have a profile formed from at least one ellipse and the trailing flank portion of the helical lobes of the male rotor have a profile formed from at least one ellipse.

wherein a female root portion is between the leading flank portion and the trailing flank portion of the female rotor and a male tip portion is between the leading flank portion and the trailing flank portion of the male rotor, wherein both the female root portion and the male tip portion are circular arcs, and

wherein a female tip portion is between leading flank portion and the trailing flank portion of the female rotor and a male root portion is between the leading flank portion and the trailing flank portion of the male rotor, wherein both the female tip portion and the male root portion are circular arcs.

11. (NEW) The conjugate pair of intermeshing rotors according to claim 10, wherein the leading flank portion of the helical lobes of the female rotor is formed by a first tangent ellipse and a second tangent ellipse and the leading flank portion of the helical lobes of the male rotor is formed by a first tangent ellipse and a second tangent ellipse.

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12. (NEW) The conjugate pair of intermeshing rotors according to claim 10, wherein the trailing flank portion of the helical lobes of the female rotor is formed by a first tangent ellipse and a second tangent ellipse and the trailing flank portion of the helical lobes of the male rotor is formed by a first tangent ellipse and a second tangent ellipse.
13. (NEW) The conjugate pair of intermeshing rotors according to claim 10, wherein the circular arc is formed of a first circular arc and a second circular arc.
14. (NEW) The conjugate pair of intermeshing rotors according to claim 10, wherein the conjugate pair of intermeshing rotors are employed with one of a compressor and an expander.